



OASI News

The newsletter of the Orwell Astronomical Society



NGC869 & NGC884 the Double Cluster in Perseus

Photo by John Hughes

Trustees: Mr Roy Adams

Mr Neil Morley Mr David Payne

Honorary President:

Dr Allan Chapman D.Phil MA FRAS

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Society Notices

Dear Members,

We have moved to using a Zoom Pro account. If you would like to join in, email Paul Whiting, treasurer@oasi.org.uk

As a result of staying at home, plus many clear days and nights during the last three months, we have had many observations and astro images submitted.

In the coming months, we will be guided by advice from the Government and Public Health England, as to when we can resume some of our activities. These are likely to be very limited at first, the Committee will decide what could be done, with the health and safety of everybody being the highest priority.

I would like to wish everybody clear skies, stay safe and I hope to see you soon.

Andy Gibbs, Chairman

Society Contact details

Email queries: info@oasi.org.uk

Facebook: Orwell Astronomical

Twitter: @OASIPswich

YouTube <https://www.youtube.com/channel/UCHgxe3QAeRVWf7vkjKkCI2Q>

Members-only message board

<https://groups.io/g/OASI>

Observatory (meeting nights only)
07960 083714

Please send material for the OASI

web site and newsletter

e.g. observations, notices of events, general interest articles, to

news@oasi.org.uk

The CLOSING date is the 15th day of the month

Access into the School Grounds and Observatory Tower

The Observatory is closed.

Articles for OASI News

News, pictures and articles for this newsletter are always welcome. Details above.

Please submit your articles in any of the following formats:–

Text: txt, rtf, rtf, doc, docx, odt, Pages, pdf Spreadsheets: xls, xlsx, OpenOffice/LibreOffice, Numbers
Images: tiff, png, jpg Please send tables as separate files in one of the above formats.

If you don't feel up to writing a major article, perhaps you might write a short note for OASI News along the lines of "This month I have mostly been observing/constructing/mending/reading/etc."?

Newsletter archive www.oasi.org.uk/NL/NL_form.shtml

Authors, please note that your articles will now be publicly available worldwide!

Reproducing articles from OASI News

If you plan to reproduce an article exactly as per OASI News then please contact the Editor – otherwise, as a matter of courtesy, please seek permission from and credit the original source/author. You may not reproduce articles for profit or other commercial purpose.

Committee 2020

Chairman	Andy Gibbs	Set overall agenda for OASI, Chair committee meetings, Press and publicity,
Secretary	Roy Gooding	Outreach meetings (jointly with Chairman), observatory decoration.
Treasurer	Paul Whiting FRAS	Finance, Supervision of applications for grants. Visits by outside groups, Observa- tory tours, Public appreciation of astronomy, Outreach activities.
Committee	James Appleton	Committee meeting minutes, Web site
	Martin Cook	Membership, Tomline refractor mainte- nance & user testing
	Matt Leeks	Safety & security
	Peter Richards	Lecture meetings, Email distribution lists
	John Wainwright	Equipment curator
	Mike Whybray	Astronomy Workshops, Child protection officer, Orwell Park School Astronomy Club.
	Andy Wilshire	Librarian
	Avtar Nagra	OASI @ Newbourne

Assistants

Martin Richmond-Hardy Newsletter, OASI @ Newbourne

Signing in and out

Please ensure you sign in and out when visiting the Observatory and/or Newbourne. This is for fire safety precautions and also provides an historic record.

Committee Meeting

This will be held on Friday 27 Nov 2020, 8pm by Zoom. Contact Paul Whiting for details.

The AGM

This will be held via Zoom on Saturday 16th Jan 2021 8pm.

Usual zoom access via Paul Whiting. Members will be informed of the link by email.

A nomination form is to be found on the last page of this magazine.

We wish all our readers and their families good health during this difficult time. Clear skies!

OASI and BAA Events

For the latest event details, please see www.oasi.org.uk/Events/Events.php

There's a Google Calendar on the OASI web site with the latest dates (and corrections!). If you want to easily add OASI Events to your own



computer/phone/tablet calendar application click this button on the website Events page (bottom right of the calendar) or use this address to access this calendar from other calendar applications.

<https://calendar.google.com/calendar/ical/Ijhs9db7Incki4sojo7092vfvc%40group.calendar.google.com/public/basic.ics>

For other astronomy news and astro pictures try our

Twitter feed <https://twitter.com/OASlpswich>

Facebook page <https://www.facebook.com/pages/Orwell-Astronomical/158256464287623>

Date, Time & Location	Contact	Event
Weekly, every Wednesday, from 20:00	Martin Cook, Roy Gooding	OBSERVATORY CLOSED Meet via Zoom.
Monday 26 Oct from 19:30 via Zoom	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI@Newbourne. Sky Notes by Bill Barton FRAS General knowledge and Harry Potter quizzes
Monday 9 Nov from 19:30 via Zoom	Paul Whiting treasurer@oasi.org.uk	OASI@Newbourne. "Searching for Evidence of Life on Venus?" Emily Drabek-Maunder (recorded)
Wednesday 11 Nov 19:00	https://britastro.org/meetings/2020	BAA webinar: Video meteor detection & spectroscopy.
Monday 16 Nov from 19:30 via Zoom	Paul Whiting treasurer@oasi.org.uk	"Mars" Paul Whiting (National Astronomy Week)
Friday 20 Nov 20:00 via Zoom	Pete Richards lectures@oasi.org.uk	Lecture: Matt Bothwell: "Big bangs to big rips: a history of 20th century cosmology". (National Astronomy Week)
Saturday 21 Nov 14:30 via Zoom & YouTube	https://britastro.org/node/21796	BAA Historical Section Webinar Dr Geoff Belknap - The Early History of Astrophotography

Date, Time & Location	Contact	Event
Monday 23 Nov from 19:30 via Zoom	Paul Whiting treasurer@oasi.org.uk	OASI@Newbourne. Sky Notes by Bill Barton FRAS Astronomy Quiz
Friday 27 Nov 20:00 via Zoom	Roy Gooding secretary@oasi.org.uk	Committee meeting
Saturday, 5 Dec 14:00 via Zoom	https://britastro.org/ meetings/2020	BAA Christmas Meeting via WEBINAR
Monday 14 Dec from 19:30 via Zoom	Paul Whiting treasurer@oasi.org.uk	“Bursts, bangs and things that go bump in the night” Dame Jocelyn Bell-Burnell (recorded)
Wednesday, 16 Dec 19:00	https://britastro.org/ meetings/2020	How to image the Sun in three wavelengths
2021		
Monday 11 Jan from 19:30 via Zoom	Paul Whiting treasurer@oasi.org.uk	“Galaxy Collisions” Paul Whiting
Saturday 16 Jan 20:00 via Zoom	Roy Gooding secretary@oasi.org.uk Paul Whiting treasurer@oasi.org.uk	Annual General Meeting. Contact Paul Whiting for Zoom access.

Please note that the listed events may change depending on the progress of the pandemic.

Meetings via Zoom

Paul Whiting has set up an OASI account on Zoom Pro which allows us to accommodate more participants.. To join, please first contact Paul, treasurer@oasi.org.uk – OASI members only. Be sure to install the latest version of Zoom – there’s no need to set up an account. Go to <https://zoom.us/join> and enter the meeting ID or personal link name. You will have received a link from the meeting organiser.

We meet on Wednesday evenings from 19:30 and on Newbourne evenings (see below) from 19:30.

OASI @ Newbourne

Martin Richmond-Hardy newbourne@oasi.org.uk

We normally meet at Newbourne Village Hall, Mill Lane, IP12 4NP on the 2nd and 4th Mondays (with a few exceptions). BUT In view of the COVID-19 situation all meetings at Newbourne are suspended. If OASI members would like to meet up via Zoom on those evenings, please first contact Paul Whiting with your email address to receive an invitation. Members only, please.

OASI@Newbourne Meetings

Subsequent meetings will be assessed in line with the current Government Guidelines in place at the time. Thank you for your understanding.

Oct 26 (S)	Nov 9 (T)	Nov 16 (T)	Nov 23 (S+T)
Dec 14	Dec 28 (S)		

We open up for all meetings at 7:30pm. Star Guide (S) at 7:30pm and Talks (T) at 7:45pm.

Stargazer's Guide

On the last meeting each month Bill Barton FRAS will give a short presentation of what can be viewed in the following 4 weeks plus a reminder of OASI events. During the COVID-19 isolation period these will be available on our website.

Astronomy Workshops/Informal talks

Meetings will depend on COVID-19 situation. **Talks will be via Zoom during lock-down.**

Contact Mike Whybray

Location: Newbourne Village Hall IP12 4NP
(currently via Zoom)

Meetings start at 7:30pm.

Workshops /Talks start at 7:45pm

If you are a new OASI member, or haven't been to one of these informal workshops before, they are a mixture of events of different characters including beginners talks, interactive workshops, films, etc., suitable for all. They are also a chance to chat with other members over a cup of tea and a biscuit, in a venue rather warmer than the observatory dome on a winter's night! Given a clear night, we can make use of the field for a workshop or continue afterwards with some observing.

- Monday 26th October "Sky Notes" with Bill
← + general knowledge and Harry Potter quizzes
- Monday 9th November "Searching for Evidence of Life on Venus?"
Emily Drabek-Maunders (recorded)
- Monday 16th November "Mars" Paul Whiting (National Astronomy Week)
- Monday 23rd November "Sky Notes" with Bill + Astronomy quiz
- Monday 14th December "Bursts, bangs and things that go bump in the night"
Dame Jocelyn Bell-Burnell (recorded)
- Monday 11th January "Galaxy Collisions" Paul Whiting

Bill Barton and James Appleton have offered to lead workshops as follows:

- Bill Barton: Celestial Coordinates, date TBA. New members at Newbourne have requested this workshop; Bill is willing to lead it but will defer if anyone else would rather do so.
- James Appleton: Update on OASI All-Sky Meteor Cameras, date TBA.

Do you have a subject you could workshop/talk? You could do a short one, or share the effort with a partner. Drop Mike Whybray a line! workshops@oasi.org.uk

Lectures – [eventually*] at St Augustine's Church Hall

* Subject to COVID-19 restrictions

Contact: Peter Richards lectures@oasi.org.uk

We have an exciting and interesting set of lectures by guest speakers for the Autumn.

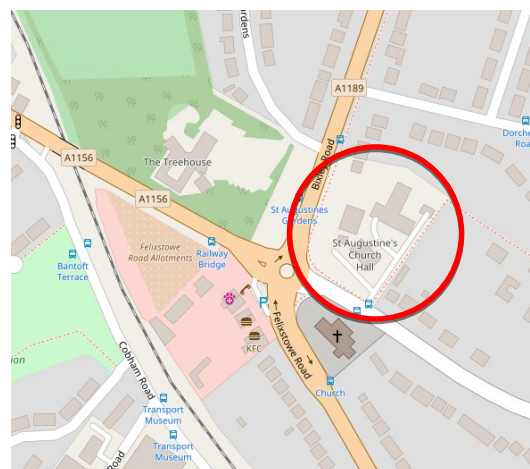
Once we're clear of C-19, the venue for lectures will be:

St Augustine's Church Hall
Bucklesham Road
Ipswich IP3 8TH.

The start time for all talks will be 8pm and, as usual, the talks will be held on Friday evenings.

Friday 20th November **via Zoom**

Matt Bothwell: "Big bangs to big rips: a history of 20th century cosmology".
(National Astronomy Week)



Brown Dwarfs

On Friday evening 23 October we had an interesting lecture by [Dr Sonali Shukla](#) entitled "Brown dwarfs: Linking stars and planets".

Dr. Shukla holds a PhD in astrophysics from Vanderbilt University, USA. Her research areas include understanding the formation of young low-mass stars and disks around young stars and brown dwarfs. She spent a year as a pre-doctoral fellow at the Spitzer Science Center, Caltech, and continued her research as a postdoctoral researcher at Penn State University. She has served in education and public outreach, both as the Astronomy Outreach Assistant at the Institute of Astronomy and Public Engagement Coordinator at the University of



Cambridge. Previously, she served as Assistant Director for the physics department at the University of Maryland, where she developed novel outreach and educational programmes, particularly to increase inclusion and diversity of students in the physical sciences. Dr. Shukla has developed inquiry-based practical exercises that incorporate real astronomical data whenever possible. When she is not lecturing astronomy, she works for the University of Cambridge's Careers Service advising students and postdoctoral researchers in the sciences.



Dr Shukla + some of The Audience

Other local astronomy society meetings

Athaneum Astro Society

www.3a.org.uk/index.htm

Meetings suspended during the Covid-19 situation.

We normally meet fortnightly on Thursdays, from 7.30pm, at our dark-sky site in the Walled Garden at Nowton Park, just outside Bury St Edmunds. If you're planning on joining us for the first time, please contact us in advance, just to make sure the meeting is going ahead. We recommend that you wear warm clothing (even summer nights can be chilly, especially when the skies are clear!) and bring a flask, or insulated mug, for a warm drink. We have tea and coffee-making facilities on-site. Events are listed here <http://www.3a.org.uk/events.htm>

LYRA Lowestoft & Yarmouth Regional Astronomers

www.lyra-astro.co.uk

Due to current Corona Virus outbreak all LYRA meetings are cancelled until further notice.

DASH Astro

Darsham And Surrounding Hamlets <http://dash-astro.co.uk>

Meetings are normally held at New Darsham Village Hall and all DASH Astro observing sessions will take place at WESTLETON COMMON. ASOG observing sessions and locations may be arranged at the time of observation. Unless stated all group meetings will take place from 7:30 pm. on Sundays

Meetings will be assessed in line with the current Government Guidelines in place at the time. Thank you for your understanding at this time. Stay Safe.

Note * Guest Speaker Evenings - Admission Fees:- Members Free, Non Members £2:00

Meetings are now on Sundays.

- | | |
|--------|---|
| 01 Nov | Meeting:- Chris Bailey – Meteors and How to detect them by Radio. |
| 15 Nov | Dash Observing Session (Sunset 15:59 Moonset 16.21 0.2% Moon) |
| 29 Nov | Meeting:- David/Ian/ Steve on Multi Messenger Astronomy and Gravitational Waves |

BAA news

For full details of all meetings or cancellations, please go to <https://britastro.org/meetings/2020>.

BAA Webinars

October

Wednesday, 28 October – 19:00	BAA Annual General Meeting Via Webinar
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November

Wednesday, 11 November – 19:00	Video meteor detection & spectroscopy
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Saturday, 21 November – 14:30	The Historical Section's Annual Meeting Dr Geoff Belknap - The Early History of Astrophotography Dr Belknap is head curator of the National Science and Media Museum, Bradford. The webinar is open to all.
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The events page for our section webinar is at
<https://britastro.org/node/21796>

People can join either via Zoom
<https://us02web.zoom.us/j/89322266036?pwd=dmJKd2taRzh0bG90ZFVqayt0aUUxZz09> or via the BAA YouTube channel

December

Saturday, 5 December – 14:00	BAA Christmas Meeting via WEBINAR
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Wednesday, 16 December – 19:00	How to image the Sun in three wavelengths
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FAS

Michael Bryce, FAS Newsletter Editor

The next issue of the FAS Newsletter is due this December and as usual we would like to include content from FAS Societies.

So what have you been up to over the Summer? Plenty of Zoom Meetings I suspect. But I'm sure there are some of you keen observers who have been observing Mars during this apparition. It would be good to include some images of Mars both through photography and through hand drawings. Observations of other astronomical objects are always welcome of course. And if any of you have organised any public observing events (with social distancing in place of course) details on that would also be welcome.

So if you have any reports of Society meetings or any observations please send them to me at the email address below. Our deadline for articles and other content is 15th November, please send them to newsletter@fedastro.org.uk.

From the interweb

An appetiser – making a chocolate telescope

<https://www.facebook.com/groups/445056098989371/>

NASA probe OSIRIS-Rex

<https://phys.org/news/2020-10-nasa-probe-osiris-rex-boops-asteroid.html>

East Anglian Film Archive

Martin Cook has found this footage of Orwell Park Observatory in an old Ransomes advertising film. The small clip of the inside of the Observatory is at approximately 22 minutes.

<http://www.eafa.org.uk/catalogue/548>

Frank Hyde

Pete Richards found this Anglia TV film (no sound) of Frank Hyde's radioastronomy observatory at St Osyth, Essex.

<http://www.eafa.org.uk/catalogue/215587>

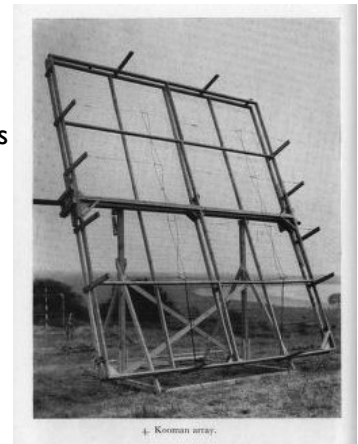
Frank Hyde's radio astronomy book is also online:

<https://archive.org/details/RadioAstronomyForAmateurs/page/n13/mode/2up>

Martin RH [Ed.]: This book was published in 1962: I have the 1965 edition which prompted me to build a Kooman array at school, courtesy of the woodwork teacher. It was mounted on the roof of the gym with a very (too) long feed to the physics lab. The receiver was an old valve VHF TV tuner plus the 5-stage amplifier on p187, which made a good oscillator!

NASA to Announce New Science Results About Moon

NASA will announce an exciting new discovery about the Moon from the Stratospheric Observatory for Infrared Astronomy (SOFIA) at a media teleconference at 12 p.m. EDT Monday, Oct. 26. Audio of the teleconference will stream live on the agency's [website](#).



The Night Sky in November 2020

Martin RH

All event times (GMT/UTC) are for the location of Orwell Park Observatory
52.0096°N, 1.2305°E.



Sun, Moon and planets

Sources: <http://heavens-above.com/PlanetSummary.aspx>
<http://heavens-above.com/moon.aspx>

Times UTC

Object	Date	Rise	Set	Mag.	Notes
Sun	1	06:51	16:26		The next sunspot cycle has started.
	30	07:40	15:48		
Moon	1	17:05	07:27		Full moon 31 October 14:49 Last quarter 08 November 13:46 Perigee 14 November 11:44 New moon 15 November 05:07
	30				First quarter 22 November 04:45 Full moon 30 November 09:30 Apogee 27 November 00:29
Mercury	1	05:37	16:02	1.6	
	30	06:42	15:13	-0.7	
Venus	1	03:33	15:28	-3.9	
	30	05:02	14:40	-3.9	
Mars	1	15:47	04:37	-2.1	25 Mars above the Moon
	30	13:44	02:52	-1.2	
Jupiter	1	12:47	20:33	-2	19 Moon near Jupiter
	30	11:08	19:06	-1.9	
Saturn	1	13:02	21:01	0.6	19 Moon near Saturn
	30	11:14	19:19	0.6	
Uranus	1	16:20	06:49	5.7	Opposition 31 October
	30	14:24	04:49	5.7	
Neptune	1	14:57	02:00	7.8	
	30	13:03	00:05	7.9	

Occultations during November 2020

James Appleton

The table lists occultations during the month under favourable circumstances. The data relates to Orwell Park Observatory, but will be similar at nearby locations.

The events should be readily visible in small telescopes or binoculars. The first two columns list the date and time (UT) of the occultation. Column three gives the phenomenon: 'D' denotes a disappearance and 'R' a reappearance. The table lists circumstances of disappearances and reappearances as dictated by the visibility of each phenomenon (determined by altitude, lunar phase, etc). Column four details the lunar phase ('+' for waxing and '-' for waning). Columns five and six give the altitude of the Sun and the star, both in degrees. A negative solar altitude means that the Sun is below the horizon. Columns seven and eight provide the star's magnitude and catalogue number.

The data relates to Orwell Park Observatory, but will be similar at nearby locations.

Please note that times are shown in UTC.

Date	Time (UT)	D/R	Lunar Phase	Sun Alt(°)	Star Alt(°)	Mag	Star
11 Nov	05:29:15	D	0.21-	-15	33	4.0	3 Vir, v Vir
	06:33:08	R		-6	40		
22 Nov	20:52:52	D	0.56+	-45	18	5.7	69 Aqr, τ^1 Aqr
22 Nov	22:12:39	D	0.57+	-54	10	4.1	71 Aqr, τ^2 Aqr
23 Nov	22:41:19	D	0.66+	-56	16	7.2	ZC 3480
25 Nov	23:21:49	D	0.83+	-59	29	6.1	26 Cet
29 Nov	19:14:20	D	1.00+	-31	32	5.9	ZC 593

There is a grazing lunar occultation with track passing close to Orwell Park Observatory at 02:30 UT on 07 November. Further details are on the OASI website: http://www.oasi.org.uk/Occs/Occ_summary_2020.php

Meteor showers during November 2020

Source: BAA Handbook 2020 p100-101 and <https://in-the-sky.org/newsindex.php?feed=meteors>

Shower	Normal limits	Maximum	Max RA/ Dec.°	ZHR at Max	Notes
Southern Taurids	Sept 10 – Nov 20	Nov 5	03:33 +12.9°	5	Southern branch of the Taurid complex. Slow meteors. Double radiant. Broad peak. Unfavourable.
Northern Taurids	Oct 20 – Dec 10	Nov 12	03:57 +22.3°	5	Northern branch of the Taurid complex. Slow meteors. Very favourable.
Leonids	Nov 6–30	Nov 17/18	10:17 +21.4	15	Very fast meteors, many with persistent trains. Enhanced activity unlikely until the late 2020s. Very favourable.

Shower	Normal limits	Maximum	Max RA/ Dec.°	ZHR at Max	Notes
November Orionids	Nov 13 – Dec 6	Nov 28		3	Not mentioned in the BAA pink book but details are here https://in-the-sky.org/news.php?id=20201128_10_100
a-Monocerotids	Nov 15–25	Nov 21	07:48 +0.9	?	Occasional ver short-lived outbursts in activity, most recently in 1995 and possibly 2016. Very favourable.

For radio observation, use reflections from Graves radar on 143.050MHz or the Brams transmitter in Belgium on 49.97MHz.

Visible ISS passes $\geq 15^\circ$ max altitude

Source: <http://heavens-above.com/PassSummary.aspx?satid=25544>

Times are BST until 25 Oct. Predictions are approximate (22 Oct) due to craft adjustments. Check the day before.

Date	Bright ness (mag)	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
01 Nov	-2.2	04:12:08	35°	E	04:12:08	35°	E	04:14:15	10°	E
01 Nov	-3.7	05:45:04	16°	W	05:47:40	81°	S	05:51:02	10°	E
02 Nov	-3.9	04:59:16	57°	W	04:59:53	86°	S	05:03:16	10°	E
03 Nov	-2.1	04:13:28	34°	E	04:13:28	34°	E	04:15:30	10°	E
03 Nov	-3.5	05:46:25	17°	W	05:48:52	60°	SSW	05:52:11	10°	ESE
04 Nov	-3.8	05:00:37	58°	WSW	05:01:07	72°	SSW	05:04:29	10°	ESE
05 Nov	-1.9	04:14:50	31°	ESE	04:14:50	31°	ESE	04:16:44	10°	E
05 Nov	-2.8	05:47:47	17°	W	05:49:57	35°	SSW	05:53:04	10°	SE
06 Nov	-3.4	05:02:02	46°	SW	05:02:15	47°	SSW	05:05:31	10°	SE
07 Nov	-1.6	04:16:20	24°	SE	04:16:20	24°	SE	04:17:52	10°	ESE
07 Nov	-1.9	05:49:17	14°	WSW	05:50:54	19°	SW	05:53:22	10°	SSE
08 Nov	-2.3	05:03:38	26°	SSW	05:03:38	26°	SSW	05:06:09	10°	SSE
21 Nov	-1.7	17:52:40	10°	S	17:54:26	16°	SSE	17:54:26	16°	SSE
22 Nov	-1.5	18:40:16	10°	SW	18:41:39	21°	SW	18:41:39	21°	SW
23 Nov	-2.7	17:52:43	10°	SW	17:55:45	32°	SSE	17:55:50	32°	SSE
24 Nov	-2.1	17:05:20	10°	SSW	17:08:04	23°	SSE	17:09:59	15°	ESE
24 Nov	-1.8	18:41:09	10°	WSW	18:42:56	28°	WSW	18:42:56	28°	WSW

Date	Bright -ness (mag)	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
25 Nov	-3.5	17:53:25	10°	WSW	17:56:43	55°	SSE	17:57:02	52°	SE
26 Nov	-3	17:05:45	10°	SW	17:08:57	42°	SSE	17:11:06	18°	E
26 Nov	-1.8	18:42:13	10°	W	18:44:03	29°	W	18:44:03	29°	W
27 Nov	-3.9	17:54:24	10°	WSW	17:57:47	78°	S	17:58:06	69°	ESE
28 Nov	-3.6	17:06:37	10°	WSW	17:09:58	67°	SSE	17:12:09	20°	E
28 Nov	-1.7	18:43:20	10°	W	18:45:05	28°	W	18:45:05	28°	W
29 Nov	-3.9	17:55:30	10°	W	17:58:54	87°	S	17:59:08	75°	ESE
30 Nov	-3.8	17:07:40	10°	W	17:11:03	85°	S	17:13:13	21°	E
30 Nov	-1.6	18:44:27	10°	W	18:46:09	27°	W	18:46:09	27°	W

Starlink passes

<https://heavens-above.com/AllPassesFromLaunch.aspx>

For a dynamic 3-D display, see <https://heavens-above.com/StarLink.aspx>

Comets with magnitude brighter than magnitude 10

Source: <https://heavens-above.com/Comets.aspx> and BAA Handbook p95.

Click on the comet name for more information (remember to set your location in heavens-above.com).

Comet	Brightness	Constellation	
		1 Nov	30 Nov
88PHowell	8.6	Sagittarius	Capricornus
C/2020 M3 ATLAS	8.6	Orion	Auriga

Astronomy on the radio

During virus isolation these slots will either be reports read by the host or via phone to the studio.

Bill Barton's Radio Broadcast

ICRFM (Ipswich Community Radio) 105.7 MHz at about 08:25 in the morning of the first Wednesday of each month. I aim to cover what there is to see in the sky and then a little bit on something topical.

ICRFM is also available to listen to over the Internet and there is a listen again option on their website.

<http://www.icrfm.com>

David Murton's Radio Broadcast

On 1st Tuesday of the month, 2.40pm (note change of time) on the Lesley Dolphin show on BBC Radio Suffolk – now digital (channel 10c) and FM 103.9 (Ipswich), 104.6 (west Suffolk), 95.5 (Lowestoft), 95.9 (Aldeburgh) and the internet. <https://www.bbc.co.uk/radiosuffolk>

Hi Ho. It's Off To Mars We Go

With a little bit of Perseverance : Library article

It was an early grey day start on 30th July 2020 at 07:50hrs EDT (11:50 GMT) as the Perseverance Rover took off with the aid of an Atlas V rocket to Mars. It is due to take about 7 months before it lands in the 28 mile wide Jezera Crater, on 18th February 2021. This crater now dry is believed to have contained a water delta 3.5 billion years ago. On landing, the mission will take at least one Mars year (1.88 earth years). The launch took place from Space Complex 41 at Cape Canaveral Air Force Base in Florida.

One of the most important questions that are asked about *Perseverance* is what can it do that the other Rovers already on Mars cannot. The answer to this is that the Rover is the only vehicle that has been modelled to collect and cache rock and soil samples which will be gathered by future missions and returned to Earth. This will allow scientists to check for signs of earlier microbial life. The instruments on the Rover will also check for ancient habitable conditions. The Martian atmosphere will be utilised to test if oxygen can be manufactured and cloud and weather formations analysed to provide data for subsequent missions. New laser technology will be employed to analyse rocks and soil allowing for chemical footprint investigations and mineralogy. It will also be the first Rover to be in possession of a drone helicopter called “*Ingenuity*” fitted to its undercarriage. It has a mass of 1.8 kg and is solar powered. It will be used to search out convenient routes for the rover to travel. Flying one of these will be quite tricky as the atmospheric density on Mars is 99% less dense than on Earth and temperatures may drop to -90°C.

The Atlas V rocket used was a United Launch Alliance 541 procured under NASA's Launch Services Programme. The ULA is a joint venture between Lockheed and Boeing. The figure used in the flight details, in this case 541, details the rocket configuration. The first figure denotes the payload fairing size, the second figure the number of solid rocket boosters and the last figure denotes the number of Centaur engines used. The main engine (RD-180) delivers at sea level about 860,300 lbs of nominal thrust and weighs 12,081 lbs. It is designed and made by NPO Energomars, a Russian conglomerate. Fuel used is liquid oxygen, and the two thrust chamber engine is supplied with hydraulics for control valve activation. If operations require additional thrust during lift off up to three additional Aerojet Rocketdyne solid rocket boosters can be added to the Atlas V 400 series and up to five on the Atlas V 500 series. The RL10 propulsion system powers the second stages of both the Atlas V and delta IV, and uses high energy liquid helium as a fuel.

The point at which the launch vehicle detaches from the spacecraft, a segment of the journey known as the cruise phase is put into operation. The Perseverance rover and its descent equipment are preserved inside the aeroshell which is itself connected to the solar powered cruise stage. Whilst this stage is ongoing, the base engineers will set the instruments and sub systems various challenges which will check to see that all systems are fully functioning. The first of three trajectory correction manoeuvres will be performed during this stage. The concluding 45 days will be spent in the approach phase, where navigational systems will be fully checked and made ready for the final Mars landing. The entry, descent and landing phase will take about seven minutes and will commence when the peak of the Martian atmosphere is reached. At this point the spacecraft will be travelling at approximately 12,100 mph. The cruise stage of the spacecraft is discarded ten minutes prior to atmospheric entry. The spacecraft, using a procedure called ‘guided entry’ which controls the descent into the Mars atmosphere. To make sure of the best landing possible a new system called Range Trigger and Terrain-Relative Navigation has been developed. At entry plus 240 seconds and at an altitude of 11 km and velocity of 1504 km/h a 21.5 meter diameter parachute is deployed whose timing

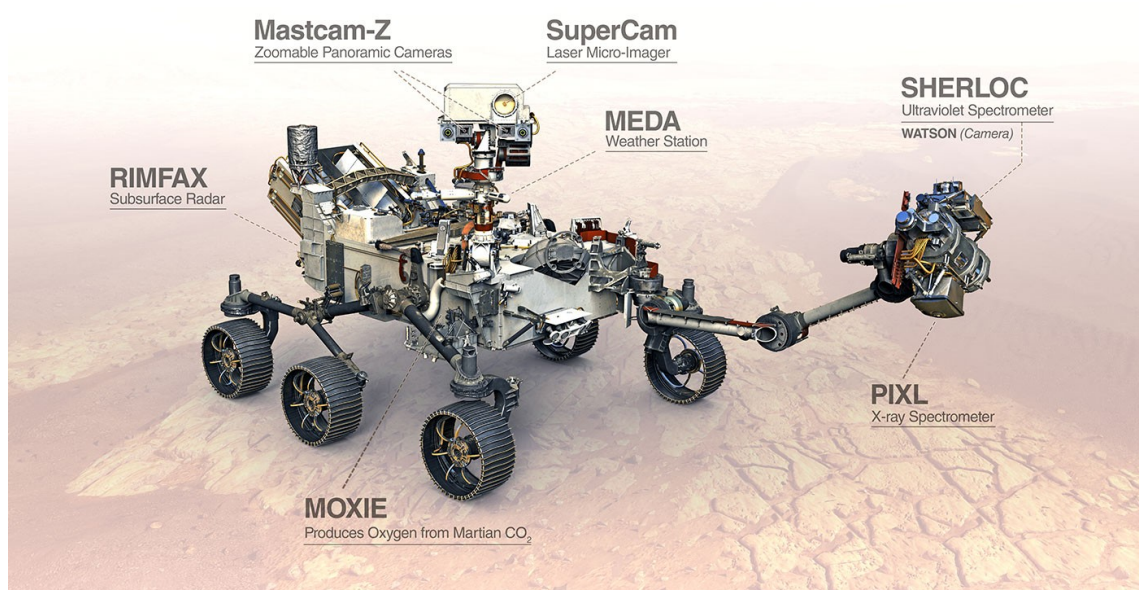
is controlled by the Range Trigger which will automatically correct the time in use, based on the navigational position. The hopeful result of this is that a smaller target landing area is required. Twenty seconds after the parachute is opened, the heat shield separates and falls away. Approximately 90 seconds after this, the rover and descent stage disconnects from the back shell incorporating the parachute. The distance from the ground at this point is 2.1 km, which will be the stage at which all eight retrorockets will power up for the controlled descent stage. These engines will slow the spacecraft down to 2.7kph by the time it is 20 meters above ground. Towards the end of the parachute plunge and the early part of the powered descent, the system uses Terrain-Relative Navigation (TRN), which speedily works out surface location and safe landing area. At 20 meters above the point that TRN has chosen, the sky crane deployment is commenced, during which nylon chords lower the rover to the ground. On completion of this act, the nylon chords are cut and the descent stage flies a safe distance away. Perseverance has touched down at about 3:45 local time. As soon as this occurs, the computer systems switch from landing to surface mode. This is the start of day one on Mars. Each Martian day takes 24 hours 39 minutes and 35 seconds. They are hoping that Perseverance will remain operational for one Martian year which is roughly 687 Earth days.

This is the fifth rover that NASA has sent to Mars. It's car size – 3.07m long 2.76m wide and approximately 2.2m high, and has a weight of 1025 kilograms whilst on Earth. It is also 3cm longer and 126 kilograms heavier than Curiosity. It is also fitted with a robotic arm 2 meters in extension, and swings a turret weighing 45 kilograms carrying instruments including a large drill. The aluminium wheels are narrower but with a larger diameter than Curiosity: 52.5 cm to 50.0 cm, and are coated with cleats to provide a better traction.

The rover's 45 kg generator utilises the heat source provided by 4.8 kg plutonium dioxide to provide power.

On the aft crossbeam there are three silicon chips stencilled with 10.9 million names sent in by people from around the world and the names of 155 people who were the finalists in NASA's "name the rover essay".

The first 90 sols (1 sol = 24hr 39mins 35secs) will be spent by the team checking all scientific instruments and moving parts.



Picture credit: <https://www.nasa.gov/perseverance/images>

Perseverance Rover is fitted with seven necessary instruments:

- Mastcam is a highly developed panoramic and stereoscopic zoom camera.
- Mars Environment Dynamics Analyser (MEDA). This provides procedures to calculate many land based measurements, such as wind speed, temperature and pressure and dust granule size.
- Mars Oxygen ISRU Experiment (MOXIE). Research checking if oxygen can be produced from the Martian Atmospheric CO₂.
- Planetary Instrument for X-ray Lithochemistry (PIXL). A high resolution imager with an X-ray fluorescence spectrometer to identify the composition of superficial materials.
- Radar Imager for Mars' Subsurface Experiment (RIMFAX). Investigates the subsurface geological structure.
- Scanning Habitable Environments with Raman & Luminescence for Organics & Chemicals (SHERLOC). A fine – scale ultraviolet spectrometer identifying minerals within organic compounds.
- Supercam. Perceive chemical and mineralogical composition analysis, from rock and regolith.

The Perseverance mission will be live streamed allowing the public up to date information and watching the investigations on Mars in real time. There are 23 cameras available from the spacecraft and robot to allow this to happen as never before. It is hoped that the mission goals in identifying the geological make-up of Mars will become more straightforward especially for the public.

References:

[https://en.wikipedia.org/wiki/Perseverance_\(rover\)](https://en.wikipedia.org/wiki/Perseverance_(rover))

<https://mars.nasa.gov/mars2020/spacecraft/rover/>

<https://www.space.com/news/live/mars-perseverance-rover-updates>

<https://www.nasa.gov/perseverance/overview>

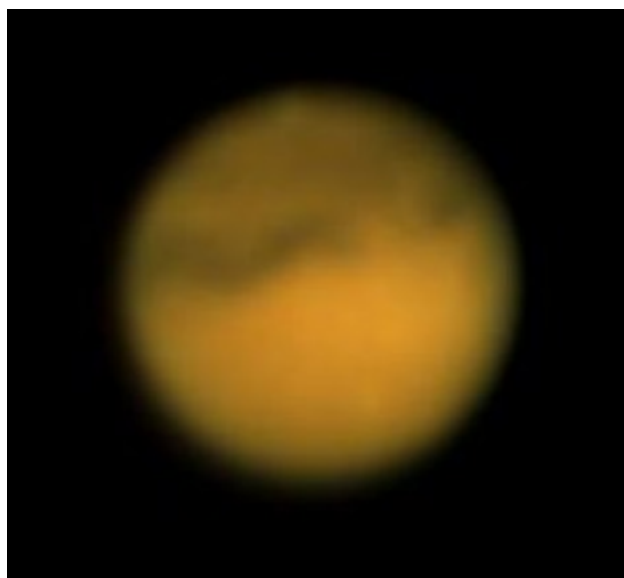
Mars

Andy Gibbs

After the OASI Zoom meeting on 14 Oct, the clouds parted to enable me to image Mars, one day after opposition.

Mars was shining at mag -2.6, at an altitude of 45 degrees,

Equipment used, Meade 200mm, LX200 with a 2.5x Barlow lens. QHY 5 II L camera. Processed in PIPP, Registax and Photoshop.



Mars & Deimos

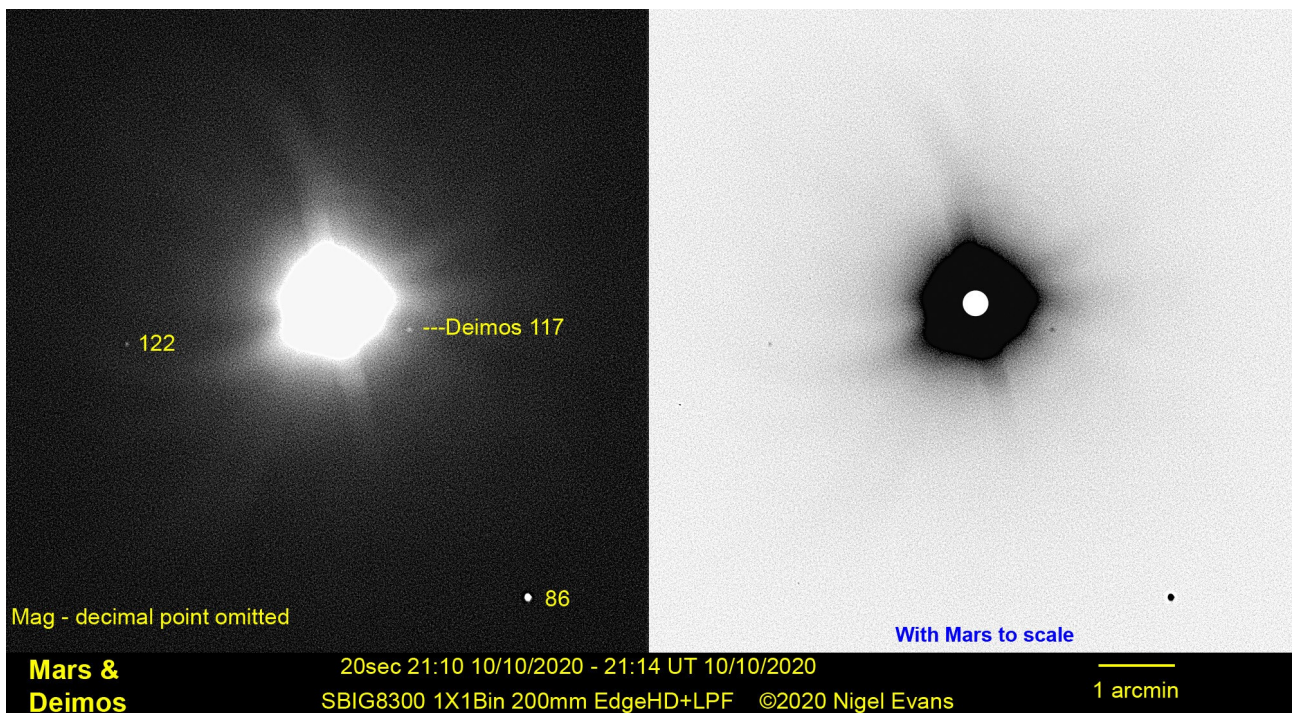
Nigel Evans

With Mars and Uranus being visible now, I thought I would have a go at capturing them - not the planets but their moons.

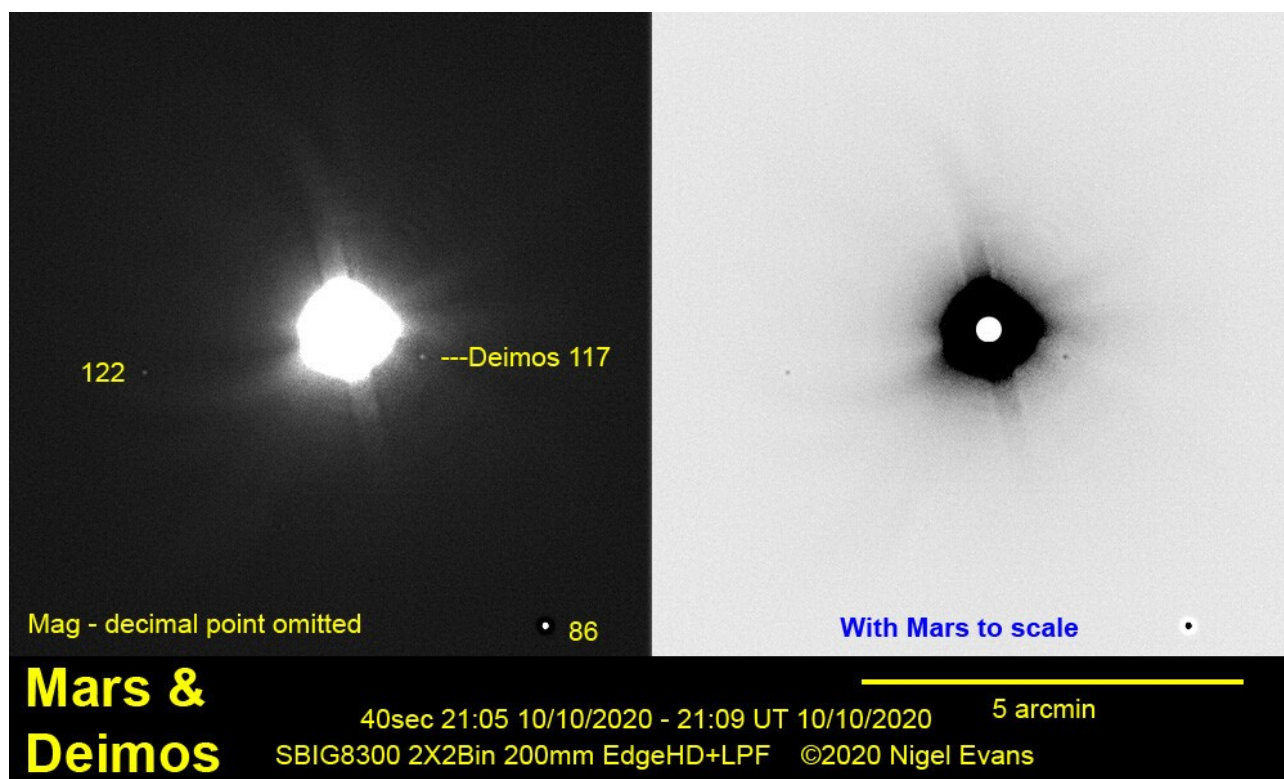
Uranus has spent the last 40 or more years wandering in the southern sky, rather out of range for northern observers. Classically it has 5 satellites and 4 of them are in reasonable range of a telescope - even a 10 second exposure can pick them out. The fifth, Miranda, is much fainter and orbits much closer to Uranus.

Mars is at a favourable opposition and so it is tempting to try and record the moons, Phobos and Deimos. The camera I am using is more suited to recording faint things in the deep sky, rather than faint things next to something 10 magnitudes brighter. I normally run the camera in 2x2 bin mode, but I tried it out with no binning as well.

So how did I do? In both cases I was able to capture Deimos (not a lot of difference really), but Phobos was lost in the glare of Mars, some 20 arcseconds away. Still, I am pleased to have 'bagged' Deimos. I do have a 'PlanB' to capture Phobos, but it doesn't work through clouds!



20 second exposure



40 second exposure

Type 1a supernova 2020uxz

Nigel Evans

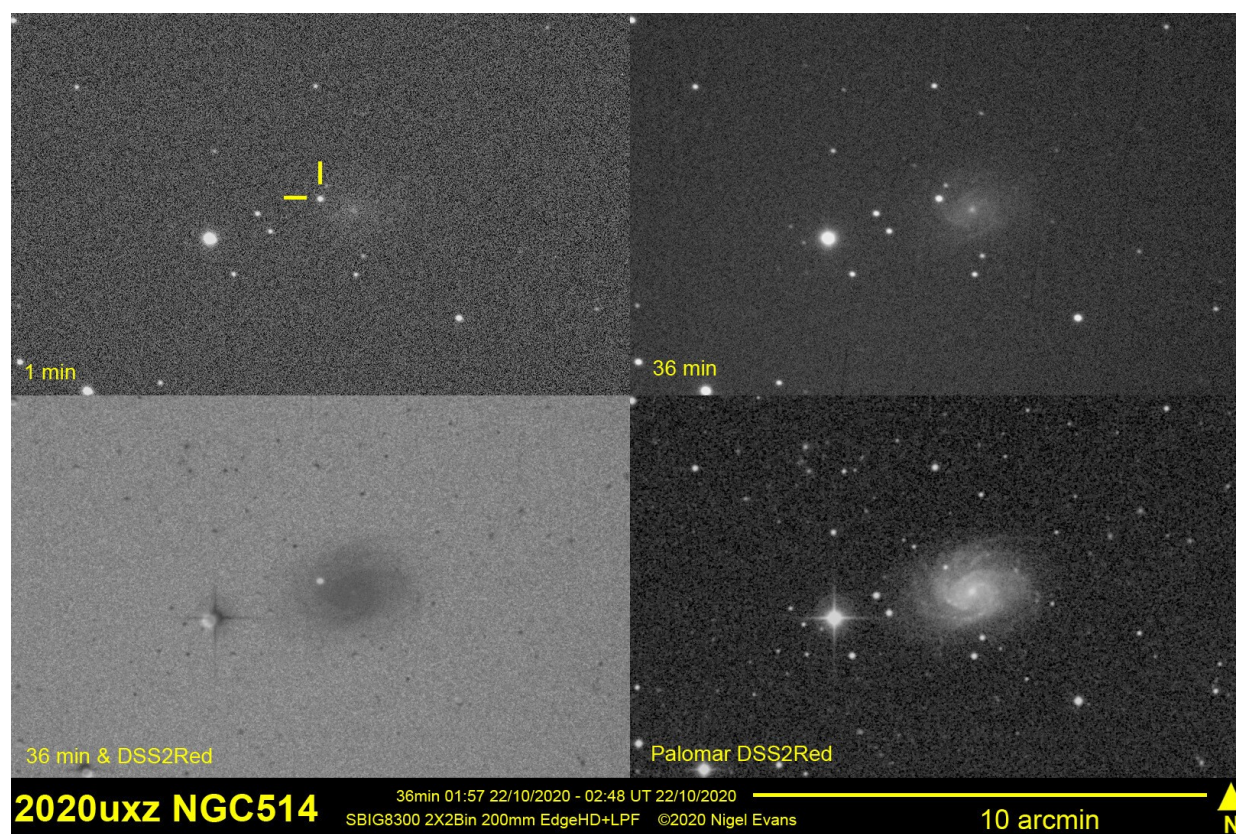
Last night (14 Oct) the skies cleared a bit to provide an opportunity to spot a recently discovered Type 1a supernova. 2020uxz is in NGC514 at around mag 14, only a few degrees north of Mars at the moment.

It did record in an exposure of 60 seconds, but even in the deeper 30 minute image it all looks rather faint, compared to other images of it (<http://www.rochesterastronomy.org/sn2020/sn2020uxz.html>). Maybe it wasn't as clear as I thought."

Yesterday morning I had another opportunity to look at it. It was a lot clearer (and quite windy), but this time I was able to see the host galaxy.



30 minute exposure



36 minute exposure

NGC869 & NGC884 the Double Cluster in Perseus

John Hughes

Having spent the last few months imaging nebulae and removing stars from images, it makes a nice change to concentrate on the stars.

One of my favourite star clusters is the Double Cluster in Perseus which is now rising nicely in the North East sky.

The Double Cluster itself is made up of two open clusters, NGC869 and NGC884 that are some 7,500 light years away.

Analysis of the stars spectra show that the light is blue shifted meaning that both clusters are moving towards Earth. NGC884 has five prominent red supergiant stars though the star clusters themselves are young with an age of c12.8 million years. This suggests that both clusters formed from the same interstellar gas cloud.



This image was captured on 9 October 2020 from my garden. It is made up of the following data;

- Red/Green/Blue - 18 subs @ 300 seconds for each filter.
- Luminance - 30 subs @ 180 seconds.
- Calibration frames - 50 separate darks, flats and flat darks.

Equipment used;

- William Optics Z103 refractor.
- ZWO ASI1600mm Pro Cooled camera.
- Chroma 1.25" filters LRGB.
- SkyWatcher EQ6-R Pro mount.
- Sesto Senso motor focuser.

Data was processed on PixInsight;

After calibration of each filter set, the master LRGB images were created and a crop was applied to the edge of each master to remove stacking artifacts.

Gradients removed from each master image using DynamicBackgroundExtraction.

MureDenoise applied.

RGB masters combined.

MaskStretch applied to L master and RGB image.

L master and RGB image combined using PixelMath in the following ratio, 75% RGB, 25% L Master.

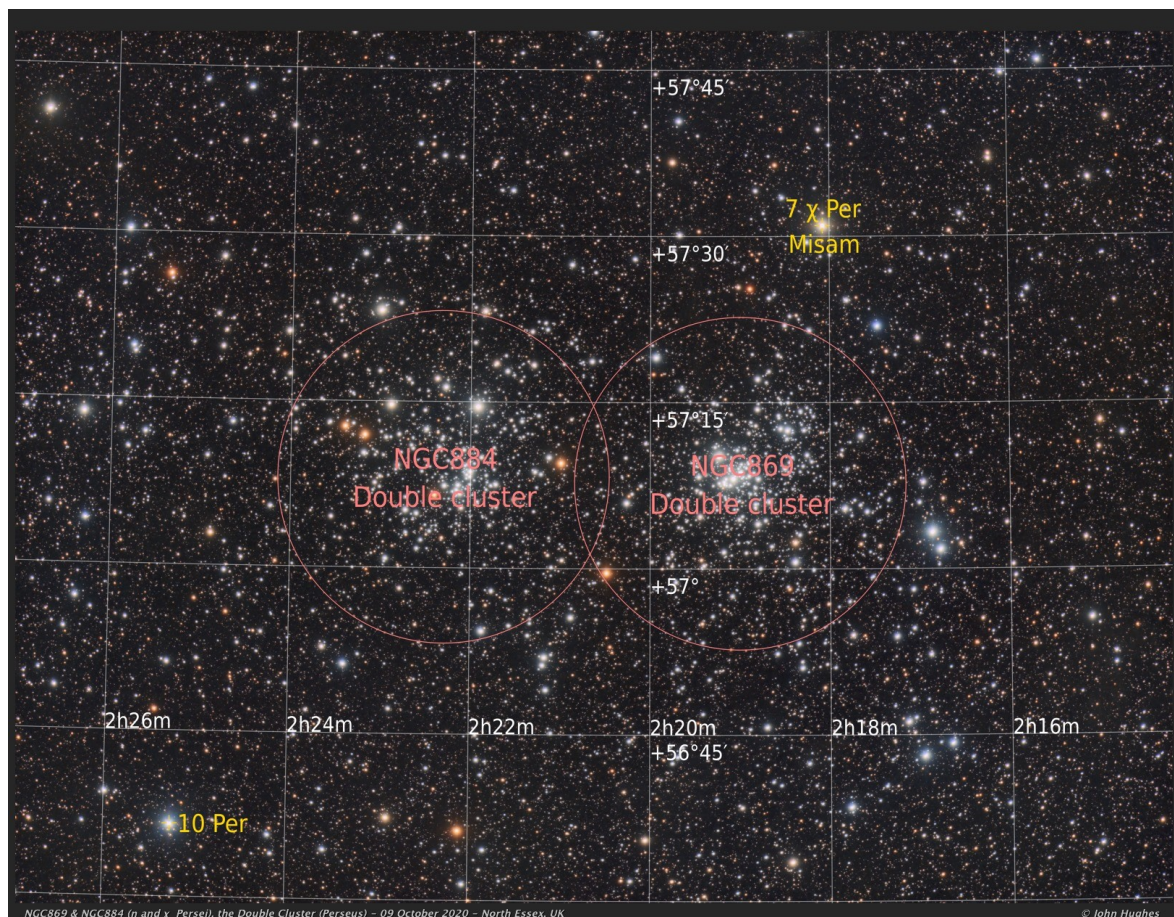
Star reduction applied to the smallest stars so as to highlight the large stars in each cluster.

Colour added to stars and background colour adjusted with a star mask applied.

Curves adjustments and colour tweaks applied.

Small amount of noise reduction applied using TGVDenoise.

Image size resampled and plate solved to create a separate star chart shown below.



OASI Officers & Committee – Nomination form

Nomination for 2021 committee

Name of Nominee:

Post:

E.g. Chairman/Treasurer/Secretary/Committee.

Proposer (Print and sign)

.....

Seconded by (Print and sign)

.....

Any members who are nominated must have given their consent.

Forms must be returned to the secretary (Roy Gooding secretary@oasi.co.uk) before the AGM.

Members who are elected to the 2021 committee will be expected to attend as many committee meetings as possible. Committee meetings are usually held about every six to eight weeks. Every committee member is given an area of responsibility to help with the running of the society.